TRICHOMYCETES OF JACKSON HOLE

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The Trichomycetes is a class of fungi found as endocommensals attached to
the chitinous gut linings of a wide range of marine, freshwater and
terrestrial arthropods. The relationship between fungus and host, the
taxonomic affinities of the class and the geographical distribution of these
fungi are points of current interest in our laboratory. The unique eco-
ological niche of the trichomycetes and the present inability to culture
all but two genera of the class have contributed to their general obscurity.
A prerequisite for any investigation of the trichomycetes is a close prox-
imity to suitable host habitats. Dr. Robert W. Lichtwardt, on previous
visits to Jackson Hole Biological Research Station (1960, 1961, 1965,
1970) has indicated the presence of many trichomycete species in the Grand
Teton National Park, several collection sites being the type localities of
genera and species (Lichtwardt, R. W. 1972. Undescribed genera and species
of Harpellales [Trichomycetes] from the guts of aquatic insects. Mycologia
64 (1): 167-197).

The class Trichomycetes contains the four orders: Amoebidiales, Eccrinales,
Asellariales and Harpellales united by their common endocommensal habit,
presence of a holdfast and reproduction by production of sporangiospores.
However, they represent a morphologically diverse group ranging from the
unbranched, nonseptate, amoebae-producing Amoebidiales to the frequently
highly branched, septate Harpellales which possess dehiscent appendaged
sporangia termed trichospores. For the past two years one of us (Moss)
has been studying the fine structure of the trichomycetes in order to
clarify certain unique aspects of their morphology (spore-appendage forma-
tion, holdfast development, spore germination), and to elucidate any
phylogenetic relationships within the four trichomycete orders and between
these orders and other classes of fungi which may be indicated by their
micromorphology.

The project was undertaken at the Jackson Hole Biological Research Station
in July 1973 to collect, identify and embed material for future fine struc-
tural studies. Collection of hosts was restricted to those forms inhabiting
freshwater streams and containing species of the Harpellales. The
collection sites selected were: Third Creek; Creek draining Two Ocean
Lake; Creek draining Emma Mathilda Lake. The species of trichomycetes
collected were: Genistellospora homothallica, Simulomyces microsporus
and Pennella angustispora, all from Simulium spp. larvae; Glotzia ephemeri-
darum from the proctodaeum of Baetis tricaudatus; an undescribed species

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of the Harpellales from the proctodaeum of *Baetis* sp. nymphs. Living hosts were dissected in the laboratory and the trichomycetes identified. Selected thalli were fixed in various mixtures and concentrations of glutaraldehyde, acrolein, osmium tetroxide and potassium permanganate; embedment of fixed and dehydrated fungal thalli was in an Epon/Araldite mixture. This material is at present receiving attention.

An attempt was made by Mr. El-Buni to culture several of the species collected on defined media. No sustained growth was obtained with any inoculation.

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